

K110605

**510(k) Summary
for the Clinical Innovations, LLC
ROMPlus**

NOV 23 2011

1. Applicant/Sponsor

Clinical Innovations, LLC

747 W. 4170 S.

Murray, Utah

USA 84123

Contact Person: Wm. Dean Wallace, MD, PhD.

Telephone: 801-268-8200

wdw@clinicalinnovations.com

Date Prepared: November 7, 2011

2. Device Name

Proprietary Name: ROM Plus and ROM Plus Controls

Common/Usual Name: Rupture Of Fetal Membranes (ROM) Rapid Diagnostic Test

Classification Name: Urinary pH (Nonquantitative) Test System and Quality Control Material (Assayed and Unassayed)

3. Predicate Devices

AmniSure ROM (Rupture Of [fetal] Membranes) Test

N-Dia, Inc.-k030849, k081767

Actim Prom and Controls

Medix Biochemica -k061886

AmnioTest (pH swab) -k914419

AmniScreen (pH liner) – k071100

4. Device Description

The ROMPlus is a rapid test for detection of premature rupture of fetal membranes. The test principle is lateral flow immunochromatography. ROM Plus is available in packages of 5 tests. Each individual test pack contains a sterile polyester swab, specimen extraction buffer solution in a plastic vial and a cassette with integral timer containing the lateral flow strip packed in a foil pouch with desiccant.

The ROM Plus Controls contain one vial each of negative, and positive controls, with integral reconstitution solution.

Clinical Innovations, LLC

747 W. 4170 S.

Murray, Utah

USA 84123

5. Intended Use

The Clinical Innovations ROM Plus fetal membrane rupture test is a rapid, qualitative immunochromatographic test for the in vitro detection of amniotic fluid in vaginal secretions of pregnant women with signs and symptoms of ROM. The test detects AFP (alpha-fetoprotein) and PP12 (placental protein 12 or insulin growth factor binding protein) from amniotic fluid in vaginal secretion. The test is for prescription use by health care professionals to aid in the detection of rupture of membranes (ROM) in pregnant women in conjunction with other signs and symptoms.

6. Technological Characteristics and Substantial Equivalence

The ROM Plus and the predicate devices cited above are both qualitative, lateral flow immunochromatographic assays intended to aid in detecting rupture of fetal membranes in pregnant women. Detection of results is by visual inspection. The analytes detected by ROM Plus and AmniSure and ActimPROM tests are similar amniotic fluid proteins. ROM Plus uses antibodies to PP12 (IGFBP-1) and AFP (alpha feto-protein). The specimen collection and extraction, test procedure, and reading and interpretation of results is similar between the three devices. All devices are intended for use in point-of-care and clinical laboratory settings. The differences between the ROM Plus and the predicate devices do not impact the safety or effectiveness of the proposed ROM Plus products for their intended uses.

7. Performance Testing

A series of nonclinical and clinical studies was conducted to assess the performance of the ROM Plus. These studies evaluated method comparison, repeatability, reproducibility, analytical sensitivity, analytical specificity and interfering substances.

- High Concentration ("High Dose Hook" effect) - for the ROM Plus upper-detection range, the PP12 and AFP were tested. Concentrations of PP12 were tested up to 400,000 ng/ml and AFP up to 200,000 ng/ml with positive visual results.
- For 100% of ROM Plus tests sampled, the lowest limit of detection (LOD) is 5 ng/ml for PP12, and 150 ng/ml for AFP (these refer to concentrations in samples of vaginal secretions before dilution with the assay buffer).
- Reproducibility was tested on different days at six levels of amniotic fluid spiked into a negative control. The assay was run on three lots of ROM Plus to determine the visual positive or negative results. Two low positives, two moderate positives and two high positives were run on three lots of ROM Plus on four different days. No difference in activity was observed.
- To determine interference and cross-reactivity of the assay, Tylenol, aspirin, and three different bath products (Lever Soap, Noxzema cream, Pert Shampoo), were spiked into the low positive control at a final concentration of 0.1% without visual loss of activity. The same bath products were spiked into the negative-matrix control and shown to be negative. In addition, human semen, urine and blood were spiked into the low positive at a 10% final concentration without loss of activity. Human semen, urine and blood were also spiked into the negative-control matrix and shown to be negative. PP12 assay does not cross-react with IGFBP-2, IGFBP-3, and IGFBP-4 based on Western Blot results. ROM Plus was shown to be negative when tested with specimens that were positive for bacterial vaginosis and sexually transmitted diseases. All samples were pH>4.5.

A multi-center prospective observational study was performed. Clinicians performing ROM Plus testing were masked from the standard Clinical Assessment results. The clinical standard of either leaking from cervical os, or pooling/fernning/nitrazine were used,^{12,16} because these are commonly used in clinical hospital protocol to evaluate ROM. Corrections for ROM based on

subsequent patient chart review was not used in this study for the detection of ruptured membranes.

Results are shown below:

Table 1: Clinical Study - ROM Plus vs. Clinical Assessment (pooling/ferning/nitrazine)

Combined	Clin-Assess	positive	negative	≥ 37	Clin-Assess	positive	negative
ROM Plus	positive	153	28	≥ 37	ROM Plus	positive	125
	negative	1	82			negative	1
Total: 264				Total: 182			
Sens	0.99	CI: 0.96 to 1.00		Sens	0.99	CI: 0.96 to 1.00	
Spec	0.75	CI: 0.66 to 0.82		Spec	0.58	CI: 0.46 to 0.71	
PPV	0.85	CI: 0.79 to 0.90		PPV	0.84	CI: 0.78 to 0.89	
NPV	0.99	CI: 0.94 to 1.00		NPV	0.97	CI: 0.85 to 0.99	
34-37 EGA	Clin-Assess	positive	negative	< 34	Clin-Assess	positive	negative
ROM Plus	positive	18	3	< 34	ROM Plus	positive	10
	negative	0	16			negative	0
Total: 37				Total: 45			
Sens	1.00	CI: 0.82 to 1.00		Sens	1.00	CI: 0.72 to 1.00	
Spec	0.85	CI: 0.64 to 0.95		Spec	0.94	CI: 0.81 to 0.98	
PPV	0.87	CI: 0.65 to 0.95		PPV	0.83	CI: 0.55 to 0.95	
NPV	1.00	CI: 0.81 to 1.00		NPV	1.00	CI: 0.90 to 1.00	

The results of all studies demonstrated that the ROM Plus and ROM Plus Controls performed according to their specifications.



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
10903 New Hampshire Avenue
Silver Spring, MD 20993

Clinical Innovations
c/o Dr. Wm. Dean Wallace
747 W 4170 South
Murray, UT 84123

NOV 23 2011

Re: k110605
Trade Name: ROM Plus Fetal Membranes Rupture Test
Regulation Number: 21 CFR 862.1550
Regulation Name: Urinary pH
Regulatory Class: Class I, reserved
Product Codes: NQM, JJX
Dated: November 14, 2011
Received: November 14, 2011

Dear Dr. Wallace:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to such additional controls. Existing major regulations affecting your device can be found in Title 21, Code of Federal Regulations (CFR), Parts 800 to 895. In addition, FDA may publish further announcements concerning your device in the Federal Register.

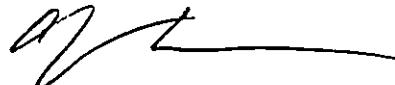
Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); and good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820).

Page 2 -

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801), please contact the Office of *In Vitro* Diagnostic Device Evaluation and Safety at (301) 796-5450. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding postmarket surveillance, please contact CDRH's Office of Surveillance and Biometric's (OSB's) Division of Postmarket Surveillance at (301) 796-5760. For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm> for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-5680 or at its Internet address <http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm>.

Sincerely yours,



Courtney H. Lias, Ph.D.
Director
Division of Chemistry and Toxicology
Office of *In Vitro* Diagnostic Device
Evaluation and Safety
Center for Devices and Radiological Health

Enclosure

Indications for Use

510(k) Number: k110605

Device Name: **ROM Plus Fetal Membranes Rupture Test**

Indications for Use:

The Clinical Innovations ROM Plus fetal membrane rupture test is a rapid, qualitative immunochromatographic test for the in-vitro detection of amniotic fluid in vaginal secretions of pregnant women with signs and symptoms of ROM. The test detects AFP (alpha-fetoprotein) and PP12 (placental protein 12 or insulin growth factor binding protein) from amniotic fluid in vaginal secretion. The test is for prescription use by health care professionals to aid in the detection of rupture of membranes (ROM) in pregnant women in conjunction with other signs and symptoms.

The ROM Plus Quality Control Kit monitors the performance of the ROM Plus Fetal Membranes Rupture Test for the purposes of external quality control. The lyophilized human positive protein control is an assayed control material for qualitative testing.

Prescription Use X
(Part 21 CFR 801 Subpart D)

AND/OR

Over-The-Counter Use _____
(21 CFR 801 Subpart C)

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE IF
NEEDED)

Concurrence of CDRH, Office of Device Evaluation (OIVD)

Division Sign-Off
Office of In Vitro Diagnostic Device
Evaluation and Safety

510(k) k110605